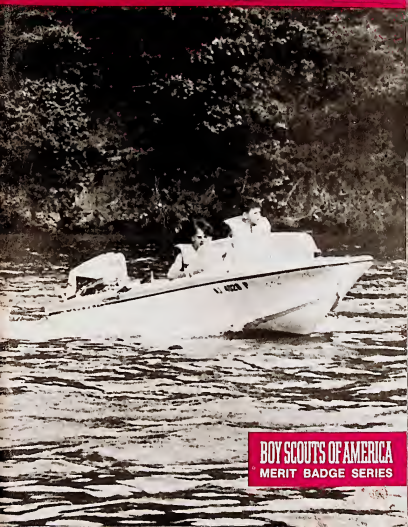




MOTORBOATING



BOY SCOUTS OF AMERICA
MERIT BADGE SERIES

How to use this pamphlet.



The secret to successfully earning a merit badge is for you to use both the pamphlet and the suggestions of your counselor.

Your counselor can be as important to you as a coach is to an athlete. Use all of the resources your counselor can make available to you. This may be the best chance you will have to learn about this particular subject. Make it count.

If you or your counselor feels that any information in this pamphlet is incorrect, please let us know. Please state your source of information.

Merit badge pamphlets are reprinted annually and requirements updated regularly. Your suggestions for improvement are welcome.

Send comments along with a brief statement about yourself to:
Boy Scout Division • Boy Scouts of America • 1325 Walnut Hill Lane, Irving,
Tex. 75062-1296.

Who pays for this pamphlet ?

This merit badge pamphlet is one of a series of more than 100 covering all kinds of hobby and career subjects. It is made available for you to buy as a service of the national and local councils, Boy Scouts of America. The costs of the development, writing, and editing of the merit badge pamphlets are paid for by the Boy Scouts of America in order to bring you the best book at a reasonable price.

MOTORBOATING



BOY SCOUTS OF AMERICA
IRVING, TEXAS

1983 Printing of the
1962 Revision

Requirements

Revised 1982

1. Before doing other requirements, swim 100 yards as follows: 75 yards with any strokes. Then 25 yards on your back using an easy resting stroke. Then rest by floating as still as you can for 1 minute.
2. Show you know safety laws for motorboating:
 - a. Have a permit to run a motorboat, if needed.
 - b. Explain laws affecting pleasure boating in your state.
 - c. Discuss with your counselor how the hazards of weather and heavy water conditions can affect both safety and performance in motorboating.
 - d. Promise that you will live up to the Scout Boating Code. Explain the meaning of each point.
 - e. Discuss with your counselor the nautical rules of the road and describe the national and your state aids to navigation.
 - f. Explain and show the correct use of equipment required by both state and federal regulations to be carried aboard a motorboat.
 - g. Explain the requirement on federal and state ventilation rules and state why this is needed.
3. Show you know how to run a motorboat by doing the following the right way:
 - a. Get in a boat.
 - b. Fuel and check motor before starting.
 - c. Start motor and get under way from a dock or beach.
 - d. Run a straight course for a quarter mile. Make right-angle turns to left or right. Make a U-turn.
 - e. Stop boat. Drop anchor. Raise it. Get under way.
 - f. Come alongside a dock. Tie up or beach.
4. Show how to:
 - a. Tie up or take boat from water.
 - b. Store gear.
 - c. Prepare motor for the winter.

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SCOUT BOATING CODE

As a Scout and Boatman:

I will do my best to maintain my boat and its equipment in a seamanlike manner and operate my boat safely not only for myself and passengers, but for all others.

I will at all times keep my boat clean inside and out: the bilges free of water and dirt, the waterline and bottom free of marine growths, topsides free of marks and damage, the cockpit and decks free of loose gear.

I will Practice Safety Afloat by:

Never overloading or overpowering my boat.

Carrying a Coast Guard approved personal flotation device for each person on board.

Carrying a Coast Guard approved fire extinguisher and by knowing how to use and maintain it.

Never allowing anyone to stand in the boat or to change seats until I have reduced to a very low speed or stopped.

Being alert to weather conditions and changes and by heading for shelter when storms threaten.

Avoiding the wake of larger craft or crossing them at a safe angle.

Never navigating my boat through swimming areas or driving under power at high speed through crowded anchorages.

Carefully observing the rules of the road both in letter and spirit.

I will be Considerate and Courteous by:

Operating my boat in accordance with my responsibilities as a helmsman and with consideration for the comfort and safety of others.

Rendering assistance promptly to those in trouble or distress and in all respects be faithful to the customs and traditions of the sea.

Never throwing garbage, rubbish, or other waste material overboard at any time.

I will learn the boating laws of my locality and will do my best to obey them at all times.

Boating Laws and Regulations

An experienced boatman is like a very good automobile driver in many ways. He knows the laws and regulations and obeys them in spirit and letter. In traffic jams or confused situations, he uses common sense. He always demonstrates good manners and is thoughtful and courteous in the operation of his boat.

There are federal, state, and local laws that affect pleasure boating and they are different for different parts of the country. These laws cover such things as minimum age for operator licensing or numbering of boats and operators, required safety equipment, lights, sound signals, speed limits, maximum horsepower of motor, hours of operation, areas where powerboats may be prohibited, and other regulations.

It is the obligation of the boatman to find out what the laws and regulations are before he ever launches his boat.

You may get this information from the nearest U.S. Coast Guard Office for federal laws, from the state agencies having jurisdiction over boating activities in your area for state laws, and from boat and motor dealers or marine operators for local laws. Check with your merit badge counselor for this information.

MINIMUM REQUIRED EQUIPMENT

EQUIPMENT	CLASS A (Less than 16 feet)	CLASS 1 (16 feet to less than 26 feet)	CLASS 2 (26 feet to less than 40 feet)	CLASS 3 (40 feet to not more than 65 feet)
BACK-FIRE FLAME ARRESTOR	One approved device on each carburetor of all gasoline engines installed after April 25, 1940, except outboard motors.			
VENTILATION	At least two ventilators with cowls or equivalent to properly and efficiently ventilate the bilges of every engine and fuel-tank compartment of boats constructed or decked over after April 25, 1940, using gasoline or other fuel of a flashpoint less than 110° F.			
BELL	None.*	None.*	One, which when struck, produces a clear, bell-like tone of full round characteristics.	
PERSONAL FLOTATION DEVICES	Classified by "type," the number and type of PFD's required on a recreational boat are dependent on the length of the boat as follows: All recreational boats less than 16 feet in length and oil canoes and kayaks must have one Type I, II, III, or IV device aboard for each person. All recreational boats 16 feet in length and over must have one Type I, II, or III device aboard for each person and, in addition, one throwable Type IV device. See page 16. **			
WHISTLE	None.*	One hand, mouth, or power operated, audible at least 1/3 mile.	One hand or power operated, audible at least 1 mile.	One power operated, audible at least 1 mile.
FIRE EXTINGUISHER— PORTABLE	At least One B-I type approved hand portable fire extinguisher.		At least Two B-I type approved hand portable fire extinguishers; OR at least One B-II type approved hand portable fire extinguisher.	
When NO fixed fire extinguishing system is installed in machinery space(s).	At least Two B-I type approved hand portable fire extinguishers; OR at least One B-II type approved hand portable fire extinguisher.		At least Three B-I type approved hand portable fire extinguishers; OR at least One B-I type plus One B-II type approved hand portable fire extinguisher.	
When fixed fire extin- guishing system is installed in machinery space(s).	None.	None.	At least Two B-I type approved hand portable fire extinguishers; OR at least One B-II type approved hand portable fire extin- guisher.	

*NOTE—Not required by the Motorboat Act of 1940; however, the "Rules of the Road" require these vessels to sound proper signals.

** (Must be Coast Guard approved.)

Rules of the Road

The eight basic rules of the road that apply almost everywhere are:



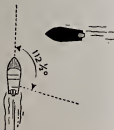
Meeting. When two boats approach each other head on, each steers to starboard (bears right, that is) so as to pass port side (left) to port side. In the Great Lakes and certain rivers where there are channels with strong currents, the vessel going downstream (or down-current) has the right of way over the one that has the current against it. That is because it is easier to control a vessel going against the current than it is to steer one being carried along by the current.



Overtaking. When one boat is overtaking another, the one doing the overtaking must keep clear of the one overtaken, which will not alter course or speed.

Sailboats always have the right of way over powerboats except with the not very likely possibility of a boat under sail overtaking one under power. Courtesy also requires that sailboats while racing be given a wide berth.

Crossing. A motorboat that has another in its so-called "danger zone" (from dead ahead to two points abaft the starboard beam—roughly translated that means coming from your right) must give way to it by altering course to go under its stern; by slowing down; or, if necessary, stopping or reversing. By the same token, if you have a boat approaching your port side (coming from your left), you have the right of way and should keep course and speed.





Leaving slips, wharves, and piers. Boats coming out of slips into open water or leaving berths at piers and wharves have no rights until they are entirely clear. Therefore, they proceed with caution and at low speed.

Tows. Although under certain circumstances powerboats have the right of way over tugs with barges in tow, it is not only good manners but sound seamanship to yield the right of way, because a small motorboat is a good deal more maneuverable than a string of barges.



Fishing boats whether anchored or under way with nets, lines, or trawls out, have the right of way. Take it easy when you are passing a fishing party.



Accidents. In cases of collision, capsize, fire, or other serious accidents, it is the duty of a boatman to stand by and render all possible assistance. It is also a tradition as old as the sea itself that mariners always go to the aid of those in distress. The good boatman is always ready and willing to offer a tow or loan gasoline to a fellow water sportsman who has suffered an engine breakdown or run out of fuel.

In addition to the previous rules, there are a few others that, because of everyday etiquette and custom, are observed carefully by the experienced boatman:

Don't tie up to government buoys or local navigation markers except in emergencies.

Don't anchor in the channel or fairway when fishing; you're blocking traffic.

Don't bar others from the use of a float or pier by tying your boat up in the only available space and then go off and leave it.

Don't be a show-off, a nautical "hot-rod." Never run fast through a crowded anchorage, past a float or pier where boats are secured, or close to a swimming area or fisherman. Don't anchor so close to another boat that yours might foul its anchor line or bump up against the other when the tide or wind changes.

Don't land at a private float or pier except in an emergency, unless invited to do so.

Never throw garbage or refuse overboard in harbors or near beaches or in lakes used for drinking water supply.

Never stare at other boating parties or into cabins as you pass. (You wouldn't peek into people's dens or living rooms, would you?)

Always be considerate of others.

Know the water

Every experienced boatman finds out all he can about the river, lake, reservoir, or bay before he ever launches his boat. If charts or other maps are available, he studies them carefully and notes the location of any possible hazards such as rocks, shallow places, reefs, or bars. He finds what means, if any, are taken to mark these underwater hazards. Charts of federal waterways are available from the U.S. Army Corps of Engineers and U.S. Coast and Geodetic Survey.

On rivers, he checks the current by talking with others who know the water; in tidal water he gets information on the time of high and low tides and the amount of fluctuation. He locates channels where he may meet much larger boats.

On reservoirs, he finds out ahead of time which areas may be restricted so that he may avoid them.

On any water with which he is unfamiliar, he goes slowly and carefully, keeping alert for unusual features or hazards.

Motorboat lights

All boats are required by law to display lights at night. These lights warn others of the presence of your boat and, in many cases, they indicate what you're doing.

A motorboat on the waters of the United States may carry the lights prescribed by an act of Congress of April 25, 1940 (Motor Boat Act), or it may carry the lights prescribed by the International Rules of the Road. In addition, there are requirements for stern, anchor, and other special lights contained in applicable Inland, Western Rivers, and Great Lakes rules.

A motorboat on the high seas must carry the lights prescribed by the International Rules and only these lights.

It should be remembered that failure to display the required lights may make your vessel liable for a penalty of \$500.

Boats at anchor must display anchor lights except those of not more than 65 feet in length in "special anchorage areas" designated by the Secretary of the Army.

Inland rules—These lights may be shown only on inland waters, western rivers, and the Great Lakes.

Under 26 feet

White, aft
12 pt., 2 ml.



Combination
red and green
20 pt., 1 ml.

26 feet or over but not more than 65 feet

White, aft
32 pt.,
2 ml.



White
20 pt., 2 ml.

Separate side lights
10 pt., 1 ml.

International waters—Lights under International Rules may be shown on waters classified by the U.S. Coast Guard as inland waters, western rivers, and the Great Lakes, and are required on the high seas.

Power vessel under 40 gross tons and sail vessels under 20 gross tons

White, stern
12 pt., 2 ml.



Combination
red and green
20 pt., 1 ml.

White
20 pt.
3 ml.

OR

White, stern
12 pt., 2 ml.



White
20 pt., 3 ml.

Separate side lights
10 pt., 1 ml.

Sound Signals

Meeting head on



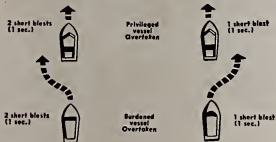
Nearly head on



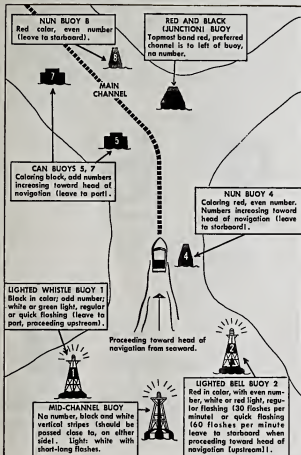
Crossing situation



Overtaking situations



Buoys



UNIFORM STATE WATERWAYS MARKING SYSTEM

U.S. Coast Guard publications now carry diagrams of uniform state waterway markers of interest to boatmen and are likely to be encountered on streams and lakes under state jurisdictions. Some of them are informational, some are warnings, and some are controlling markings. They are illustrated here and augment the Aids to Navigation shown on page 12.

OBEY



CAUTION! Type of control is indicated within the circle such as No ski, speed zone, No anchoring.

OBSERVE



INFORMATION! Tells distances, locations, other official information.

BEWARE



DANGER! Warns of rocks, reefs, dams, snags, or other hazards.



BOATS KEEP OUT! Marks waterfalls, swim areas, rapids, and other restricted areas.

CHANNEL MARKERS

United States Coast Guard Buoyage of the United States
When returning from main water body or proceeding upstream.

Can Buoy (black)



MARKS LEFT SIDE OF CHANNEL —
Boat should pass to right of buoy.

Nun Buoy (red)



MARKS RIGHT SIDE OF CHANNEL —
Boat should pass to left of buoy.

Mid-channel Buoy
(black and white)



MARKS CENTER OF CHANNEL — Boat
may pass either side.

OTHER MARKERS



RACE COURSE MARKER — Designates
a race course for competitive use.



DIVERS FLAG — Indicates presence of
divers. Boaters should exercise cau-
tion.



ANCHOR BUOY — For permanent
placement to moor or anchor water-
craft.

Dual Purpose Marking



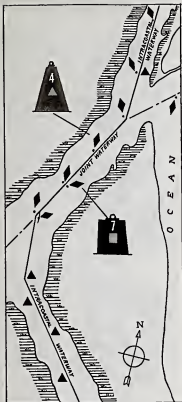
Side of channel (black with odd numbers) entering from north and east and traversed to south and west respectively.

STARBOARD



Side of channel (red with even numbers) entering from north and east and traversed to south and west respectively.

THE INTRACOASTAL AIDS
ARE CHARACTERIZED BY
THE YELLOW BORDER



DUAL PURPOSE MARKING WHERE THE INTRACOASTAL AND OTHER WATERWAYS COINCIDE

Intracoastal waterway joins another waterway, which is numbered from seaward, at buoy No. 4 and is common with it to buoy No. 7. ICW numbers and yellow borders are omitted in this section, but the triangle or square is used on the regular aids to designate the ICW.

Safety Equipment



Personal Flotation Devices

(Must be Coast Guard Approved.)

Type I PFD—an approved device designed to turn an unconscious person in the water from a face downward position to a vertical or slightly backward position, and to have more than 20 pounds of buoyancy. Recommended for offshore cruising. Acceptable for all size boats. Must be in good and serviceable condition; must be readily accessible.

Example: Typical life preserver



Type II PFD—an approved device designed to turn an unconscious person in the water from a face downward position to a vertical or slightly backward position and to have at least 15.5 pounds of buoyancy. Recommended for closer, inshore cruising. Acceptable for all size boats. Must be in good and serviceable condition; must be readily accessible.

Example: Typical buoyant vest



Type III PFD—an approved device designed to keep a conscious person in a vertical or slightly backward position and to have at least 15.5 pounds of buoyancy. While having the same buoyancy as Type II, the Type III has a lesser turning ability to allow for a comfortable design for water activities such as water skiing. Recommended for in-water sports, or on lakes, impoundments, and close inshore operation. Acceptable for all size boats. Must be in good and serviceable condition; must be readily accessible.

Example: A special purpose device



Type IV PFD—an approved device designed to be thrown to a person in the water and not worn. It is designed to have at least 16.5 pounds of buoyancy. Acceptable for boats less than 16 feet and canoes and kayaks and as a throwable device for boats 16 feet and over in length. Must be in good and serviceable condition; must be immediately available.

Example: Buoyant cushion and ring buoy

Fire Extinguishers

Fire extinguishers must be of a Coast Guard approved type. If there is any doubt, check with the nearest Coast Guard Marine Inspection Office.



Carbon dioxide type

Pull pin and point at base of fire. Pull trigger to release carbon dioxide.



Dry chemical

(cartridge operated)

Pull pin and free nozzle. Point into flame — pull trigger.



Foam

Turn extinguisher over at scene of fire and splash liquid off side-wall into flame or arch stream to surface.



Dry chemical

(stored pressure)

Pull pin and free nozzle. Aim into fire and squeeze lever.

Bailing a Boat



A bilge pump, bucket, plastic scoop, can, or large sponge should be carried aboard to bail out rain water or water coming in over the side.



Some boats have plugs that, when removed while the boat is under way, permit water to run out. They must be replaced before the boat stops.



Some motors have self-bailing attachments that operate as the motor runs.

Replacing a Shear Pin



First, remove the cotter pin holding propeller nut.



Second, remove the propeller nut.



Third, carefully place cotter pin and propeller nut where they will not be lost. Remove propeller.



Finally, remove broken shear pin from propeller shaft. Install new pin. Replace propeller, propeller nut, and cotter pin.

Boat Handling and Seamanship

Boarding a Boat



Taking first things first, we'll start with getting into the boat. When you are boarding from a float or low pier, step aboard as nearly amidships (center) as possible, keeping your weight low and using your hands on the gunwales (sides) for balance. When getting aboard from a high pier, step down to the bow (forward) deck, if there is one, because that is the higher part of the boat, and you won't have so far to step. Unless you are bent on putting a hole through the bottom of the boat, hurting yourself, or giving a diving exhibition, don't jump into the boat. Keep the dock lines tight or have someone steady the boat for you when you embark. Don't carry things aboard; keep your hands free. Have someone hand you packages after you are aboard or reach back to the float for them after you are aboard. If you are embarking from the beach, get in over the bow.

Fueling



Mix oil and gasoline in proper proportions in safety spout can. Then pour through a strainer funnel into motor tank with the tank outside the boat. (Do not use a plastic funnel on board.)

A. Make sure all open flames are extinguished. Make sure no one is smoking.

B. Close all windows, ports, doors, and engine hatches to prevent fumes from going below.

C. Make sure there is metal-to-metal contact between the nozzle and the fill pipe to prevent static spark.

D. Wipe up any spilled gasoline and turn nozzle up so that it won't drip.

E. Screw the cap on tightly.

F. If you have a blower, make sure it is properly installed so that fumes cannot reach the spark of its motor. Run the blower long enough to ensure there being no fumes before starting. Open the engine hatch for ventilation and use your nose as a detector. If you smell gasoline, don't press the starter. G. Open all hatches, doors, etc. and wait a few minutes before starting the engine.



Loading the Motor



When mounting the outboard alone, place the motor on the pier and board the craft empty-handed. Lift the motor onto transom so that preadjusted bracket bolts can be quickly tightened. Be sure a stern line will prevent the boat from moving away from the pier.



Motor at too much of an angle to boat—boot "squats"

Now for rigging the motor. If you are alone, lay the motor down on the float or wharf where you can reach it easily after you are in the boat. Set the motor squarely on the center of the transom and then set up the bracket screws as hard as you can by hand. As insurance against losing the motor, if it happens to hop off the transom, pass a line or chain through a hole in the stern bracket or around it and secure it to the stern lifting ring, if your boat has one, or make it fast around the transom knee. It doesn't matter much how you do it, but you should have some such safety device unless you like diving or dragging for a lost motor.

Boats built especially for use with outboard engines these days have transoms 15 inches high or 20 inches high that are set at an angle of 12 degrees outward from the keel. Others have a space cut out of the transom especially for the motor. When you are setting your motor, be certain that it is in the proper running position—the drive shaft straight up and down, not canted in toward the boat or angled away from it.

If the drive unit is moved in too close to the boat, it will cause the boat to run with its nose down and tend to dig in. This makes for difficult steering. If the shaft is tilted too far out from the transom, the stern will squat, the bow come way up out of the water, and your boat will not perform properly.

You know what happens when you race an automobile engine with the clutch disengaged: sound and fury but no progress. That's what occurs when you get "cavitation" with an outboard motor. One of the chief causes of cavitation is too high a transom, which brings the propeller too close to the surface, where it spins through badly disturbed water and doesn't get a real good "bite" in it.



Not enough angle—boat "plows"



Just right—means best performance

A good deal of your boat's performance depends upon how it is loaded and how the weight is distributed both fore and aft and side to side. Naturally, if everyone sits toward the stern, the bow will be waving around in the air. If you reverse this line-up and put all hands in the bow, your boat will be what the sailors call "down by the head" and will have a tendency to "shovel" water in over the bow to say nothing of lifting the propeller out of water now and then.

Don't crowd your boat. It will carry a limited number of persons safely, and the number of seats is no indication of capacity. There are several things that should be remembered when loading a boat. Distribute the load evenly; keep the load low; don't stand up in a small boat; don't overload. The weather and water conditions should be taken into account, too. If the water is rough, the number of persons carried should be reduced.

The U.S. Coast Guard requires that manufacturers of certain boats display on each boat a "U.S. Coast Guard Capacity Information Label." This requirement applies to all monohull boats less than 20 feet in length manufactured on or after November 1, 1972. Exceptions to this rule are sailboats, canoes, kayaks, and inflatable boats. The "U.S. Coast Guard Capacity Information Label" is intended to provide safety information to the boatman, who may not have expert knowledge of a particular boat's characteristics, in order to reduce the dangers of inadvertent overloading or overpowering. These recommended values are for fair weather and do not relieve the boatman of the responsibility for exercising individual judgment.

You should verify the capacity of your boat before loading to insure the boat will in fact safely carry the planned load.

If the transom has been notched to receive an outboard motor, the depth will be the distance from the bottom of the transom to the lowest point in the notch. The safe load includes the weight of the passengers and equipment. If the transom is protected by a watertight well inboard of the cut-out, the effective depth is the least depth of the boat.

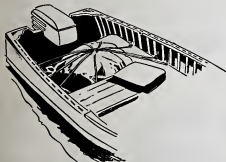
The same principle of weight distribution applies to the loading of supplies, equipment, and camping gear. As to the boat's equipment—anchor, tools, paddle, fenders, and such—never forget the old seaman's adage: "A place for everything and everything in its place." Nothing is quite so lubberly (unseamanlike) as a boat in which things are lying about loose in the bilges or on the floor boards or seats. Having gear adrift like this is dangerous and a good way in which to lose equipment. If your boat doesn't have stowage lockers in the bow or under the stern seat or bridge deck, it would be a very good

idea to build them. There is no such thing aboard a boat as too much locker space.

We have set the motor properly, trimmed ship, and are ready to get under way. Having followed the instructions in the engine manual about the proper mixture of oil and gasoline, we're ready to start the motor.

Follow the instructions in the owner's manual that was supplied by the motor manufacturer. If the engine is a gear-shift model, we have not cast off the dock lines. We've waited for the engine to start.

If the engine is not a gear-shift type, then we did not drop the lines until we were ready to pull the starting cord. And we didn't pull the starting cord until we had headed the bow toward open water.



Getting Under Way from a Beach



Proper way to get under way from a beach is for person forward to push boat into deeper water with oar while person in stern tilts motor up to protect its lower unit.

Getting Under Way from a Pier



With wind off the water — blowing the boat into the pier — the method shown in these four pictures is used. Swing the

If we were starting from a beach, we pushed the boat out of shallow water before going through the starting routine—we don't want to use the propeller to churn up the bottom.

When you are getting away from a float or pier, don't push your tiller or spin your wheel so far in one direction that the stern swings sharply against the obstruction. Remember that outboard boats do not steer like automobiles or bicycles, which follow their front wheels. In boats, the stern responds to the steering impulse first and in the opposite direction from that which the bow is going to take. So, in close quarters, give your stern enough room to swing when you turn.

Once under way there are two basic rules to follow—

Keep the boat under control: Don't run at high speed where sudden turns or stops might be necessary.

Always be alert: Keep an eye on other boats, watch for driftwood, shoals, and other obstructions.

These are things that you will do instinctively when you become a good boatman, and being a good boatman is fun.

One of the maneuvers in which you will take pride is making a landing or picking up a mooring if your boat lies off instead of being beached or snugged up to a pier or float. A good landing requires control of the boat and a knowledge of what effect, if any, the wind and current will have on the boat.



stern out, backing slowly away from the pier; and, when you're clear, shift to forward and head out into open water.

Turning a Boat



Outboard boats do not steer like automobiles, which follow their front wheels. In boats, the stern responds to the steering impulse first and in the opposite direction from that of the bow. And don't forget, in close quarters, give your stern enough room to swing.

In crossing the wake of another boat or heading into waves caused by the wind, angle in slightly off the vertical.



Docking

When you are heading downstream with the current, and the float you wish to tie up to is on the left bank, throttle the motor down and begin an easy left turn. When you are below the float, head upstream to bring the starboard side parallel to the outside edge of the float about a foot away. When your bow passes the lower end of the float, stop the engine or put it into neutral and steer alongside.





Approach at slow speed, approximately 30 degrees with the pier, alternately going ahead slowly and stopping the engine as necessary. When bow is close to the pier, turn slowly and head parallel to the pier. Then reverse engine, give left rudder, and move in against the pier.

Fasten lines, preferably the bow line first, and do not allow the free ends of the line to dangle in the water.

In tidal waters or streams where there is noticeable current, it is best to make uptide or upstream landings unless the wind is so strong that it more than offsets these factors. Where current or tidal flow do not have to be considered, make your landing with bow into the wind, if possible. A glance at a buoy, or a look at the way other boats are lying to their moorings, will tell you which way the current is setting.

Two things that only a landlubber would do are to come in for a landing at high speed and at right angles to the float. Heading for a beach, of course, you have no choice but to go right for it; but you do it slowly and swing your engine up before it hits bottom.

Here is the way to make a good landing: Suppose you are heading downstream with the current and the float you wish to tie up to is on the left bank. When you are abreast of the float, throttle the motor down and begin an easy left turn. When you are below the float, head upstream in such a way as to bring the starboard (right) side of your boat parallel to the outside edge of the float and a foot or so away from it. When your bow passes the lower end of the float, stop the engine or put it into neutral, flip the fenders over the rail, and steer the boat gently alongside. You can hold onto the float until someone takes your bow line or step ashore with it yourself. The same principles of speed and approach apply to picking up a mooring buoy.

Mooring

Three basic seamen's knots



Clove hitch



Square knot



Bowline



Correct method of making fast to a cleat.



The securing of a boat to a wharf or pier or float depends upon what there is in the way of bollards, cleats, or rings for your line to pass around or over or through.

Floats are usually fitted with cleats or rings to which lines may be led. Sometimes floats are held in place by stakes or piling and these also may be used for your mooring lines. Wharves and piers may have rings, cleats, or bollards, depending on their size and the purpose for which they were

built. You will note that the word "dock" has not been used here. That is because dock is probably the most incorrectly used word in boating. A dock is not the same thing as a pier or wharf; it is the waterway between two piers. Consequently, you cannot secure a boat to a dock, but you can moor a boat in a dock.

If your bow and stern lines have an eye spliced into one end, it simplifies mooring. The eye can be thrown over a cleat or bollard and the slack taken up on board. The eye also can be passed through a ring, the bitter end of the line passed through the eye, and then led back aboard to be secured to the bow or stern cleat as the case may be. If your lines have no eyes, a couple of figure eights around a cleat with a final half hitch to lock them will do well. For securing to bollards, piles, or stakes, a round turn and two half hitches will suffice in quiet water, but a clove hitch or bowline will be better.

Usually, one line leading from the bow is sufficient to moor a boat alongside for a short time, but a stern line as well is better practice.

When making fast to a wharf or pier in tidal waters, be sure to leave enough slack in the lines to allow for rise and fall of the tide. If you don't, you are quite likely to pull out the deck cleats by their roots when the tide falls away from under the boat or get it jammed into such a position that when the tide comes in again the boat will swamp.

Beaching



In beaching a boat, before tying up and anchoring, a convenient way to get further on shore is to roll the boat over a log.

Anchors and Anchoring

Every boat needs an anchor. What size and type of anchor you use depends on how large the boat is and what sort of bottom you generally will anchor in: rocky, muddy, sandy, etc. A short stockless anchor might serve your purposes or one of the many lightweight patented hooks, some of which hold better than others in different kinds of bottom. No matter what type of anchor you have, be sure to have it made up with the line secured to it already to use when you are cruising or making long runs.

In moderate weather, a safe ratio of length of anchor line to depth of water is six-to-one. In other words, if you anchor in 10 feet of water, 60 feet of line is the proper scope; although, if your boat is light and there is neither breeze nor current, half that would do for a short time. Not overnight, though, or if the boat is to be left unattended.

Types of
anchors in
common
use: yacht
anchor
A, patented
B, mush-
room C,
grapnel D.



Here are a few good things to remember when anchoring: Examine the anchor first and be sure that the line is attached properly and that the other end is secured to the boat; you don't have to play shot-putter with the anchor, just lower it alongside the bow; have the anchor line coiled clear for running with no kinks, bights, or knots in it; don't stand on the coil when letting the anchor go unless you want to go too.



An anchor trip at A is a useful device used for heaving in an anchor that may become wedged in rock formations and weed growths. Sequence B, C, D shows an anchor wedged between two rocks, how pressure breaks the anchor trip, and how anchor is released. "Should not be used for unattended anchoring in case of change in direction of wind or current since if anchor trips it might not reset itself."

To drop anchor, lower it slowly alongside bow of your boat, keeping anchor lines clear and free.

Mushroom and grapnel anchors in use.



When you prepare to anchor, look over the place first and then head into the wind or tide (whichever is stronger), nosing your boat in slowly until you find the spot you want. Put over the anchor when stopped and then move back under reversed engine, paying out the anchor cable about six times the depth of water. Next, take a turn around the bitts or Smeaton post and set the anchor under the momentum of the reversed engine. Have the second heavier anchor on deck ready to use in an emergency. When you have anchored, take a range check in case of dragging—this will aid in locating your anchor should you lose it.

Hitching a Boat to a Trailer



After the car is backed so that ball of hitch is as close as possible to socket on trailer, with small boots, lift trailer and set socket on ball. Then clomp the coupling into a locked position.



Final step—rig safety chain from trailer to car bumper brackets. With motor not equipped with trolling locks, motor is tilted forward so that it rests against cross member holding boat to trailer, and a stick is lashed between shaft housing and engine bracket to keep it from tilting back into driving position.



Putting a Boat in Water

One way to launch a boat from a trailer is to use an electric hoist. With its strong canvas slings, it picks boat up off trailer and lowers it into the water.



Another way to launch a boat is to back trailer to launching site. With bow line held taut, push boat so that it rolls on trailer rollers slowly into water.

Free of trailer, boat is afloat.



Tilt the motor into the driving position. Other boy holds bow painter.



Scout backs slowly into stream and is under way.

(Some trailers have tilt beds. You unlock tilting lock, trailer bed tilts, and boat slides off easily.)

Care of Boat, Motor and Equipment



With the fun that goes with owning or operating a boat also goes the responsibility for keeping that boat, its power plant, and equipment in first-class condition. That can be fun, too, if it is tackled in the right spirit and done in the right way. Maintaining the appearance and efficiency of one's craft can be a source of great pride to the boatman. You can pay him few compliments more warming than to say: "Everything about his boat is shipshape and Bristol fashion."

The origin of that expression is somewhat obscure, but it is believed to have come from way back in the heyday of sailing ships when windjammers out of Bristol, England, had a lofty reputation for being scrubbed and polished with their gear kept in the best possible shape.

A boat in which sound material and excellent workmanship have been combined will last a lifetime, if it gets proper care along the way. It can become a pitiful hulk in a few years, if roughly used and neglected. There are few sadder sights than a once lovely boat blistering and rotting for want of attention nor a happier one than a fine old-timer, shining and sound, reveling in her element like a two-year-old.

There is nothing complicated or very hard about keeping a boat looking—and acting—like new. Timely and intelligent use of scraper, sandpaper, paint, varnish, and scrubbing brush can do wonders along these lines. Most of the marine paint companies put out handbooks or pamphlets giving suggestions as to how to preserve the finish on your boat whether it be wood, canvas, plastic, or metal. Get one of the books, follow its directions, and you will be surprised at how much paint and varnish will do for the appearance and life span of your boat.



A word of warning here: Be sure to use paints and varnishes and fillers made especially for marine use. Ordinary house paint will not stand up under the punishment boat surfaces have to take and there is no such thing as good cheap paint.

Normally, boats are exposed to all sorts of weather: to sun and rain and hail and dampness and marine growths. To combat these forces, your boat must have the best possible protection. That comes from careful preparation of the surface to be treated and then the use of quality paint and varnish.

Here are a few tips on the care of wooden boats.

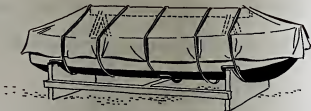
Don't leave bare wood or canvas exposed to the weather; get it painted at once.

If you keep your boat in salt water, use special antifouling paint for the bottom to discourage weeds and barnacles and to keep out the destructive teredo worm.

If you haul your boat up frequently on sandy or gravelly beaches, use either a good marine bronze paint or a hard racing finish for the bottom.

If your boat has been out of water for a long period, it may leak when put overboard again. That means that the planking has dried out, thereby opening up the seams between planks. If the drying-out has not been too extensive, the swelling of the planking in the water may make the boat tight again. If not, clean out the leaking seams and force a mixture of turpentine and marine glue into them. When the turpentine evaporates, the glue is left to seal the seams and it will "give" as the planks dry and swell. If you prefer, prepared elastic seam compounds can be used.

Bilges should be cleaned thoroughly of dirt and grease be-



Covering should be weathertight not airtight to prevent mildew and rot.

fore painting. Remember that a good paint job makes wood less liable to absorb oil and grease.

Always paint from the top down.

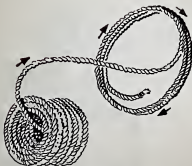
Pick a dry day for your painting and varnishing jobs.

All boats should be kept clean inside and out and they should be kept dry. Boats get water aboard from rain, spray, and wet bathing suits. It can be removed with a pump, bailing can, or sponge, depending on the quantity. On a float or the beach, just dump the water out and then dry the boat with a sponge or chamois cloth.

Keep a chamois on board to wipe moisture off the fire extinguisher, deck hardware, and fittings. It is a good article to use, too, for wiping dew and water from seats, rails, and varnished surfaces. If your boat is used on salt water, be sure to remove salt from all varnished woodwork with fresh water. This little job will save you later from having to use varnish remover and sandpaper on dark, salt-pitted brightwork and building up new coats of varnish. It takes three to five of those coats to do the job well.

Dents, nicks, and gouges in rails and topsides should be filled with plastic wood or something called marine dough, smoothed down, then painted or varnished, as required. Touch-up jobs like these keep your boat looking well and prevent water and weather from getting at the wood.

Water lines and topsides will, in certain waters, acquire soot and oil streaks. A scrubbing brush and a gentle abrasive cleanser will remove the disfiguring marks. If your boat is in



water where marine growth attach themselves to bottom and water line, get the boat up on the beach or float and give it a good scouring with a stiff brush. If it is merely slimy, rubbing it with canvas will do the trick. If, in the process of removing barnacles and other growth, you also remove so much paint that the wood or metal is exposed, then give her a coat of bottom paint before putting her overboard again.

Dock and anchor lines, life jackets, cushions, canvas-covered fenders, etc., are bound to get wet on boats. That is no excuse, though, for putting them away while they are still soggy or damp, unless you want to encourage mildew and rot. Careless handling of these items of equipment means a shorter life for them and expensive replacements. Dry your lines, cushions, and such in the sun before stowing them. And you want to be sure that the locker is well ventilated. Don't throw your gear into lockers any which way; stow it neatly so that you can get at each piece when you need it without upsetting everything else.

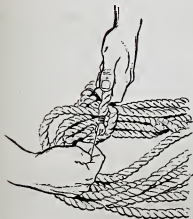
After your lines are dry, coil them neatly—clockwise or “with the sun” as the old sailormen say—and fix them so they won't uncoil and become snarled. That can be done by making two or three turns around the outside of the coil, locking them with a half hitch, and passing the bitter end through the eye of the coil above the wrapping. Another trick is to leave your coil in its circular form and hold it this way by taking a few turns of light thread around the hoop at three or four places.



Nothing betrays a landlubber any quicker than the condition of his lines. Rope, incidentally, is a word rarely used around boats. What's rope on a farm or construction job is "line" on a boat. Old seamen used to say that there were only four ropes on a full-rigged ship: foot rope—on which sailors stood while working on yards, bolt rope—to which sails are sewn, rope's end—knotted for punishing seamen, and bucket rope—tied to the handle of a bucket for ease in getting it overboard and back again. On the modern motorboat only the bucket rope should be an item of equipment.

Few things are more lubberly and less seagoing than line with ends that have been allowed to unravel and fray into "cows' tails," the name applied in derision by sailormen to such sights. Ends should always be protected by back-splicing or whipping. If your boat lies to the same anchor or permanent mooring when not in use, the mooring pennant is subject to chafe where it passes through the bow chock. A good seaman protects the line at this point by wrapping it in canvas (parceling), either stitching it into place or "serving" it (wrapping it tightly with marline or some other treated twine). A piece of bicycle tire is also good for protecting lines at chafing points.

Anyone who can read and can tell the difference between a pair of pliers and a spark plug can do an adequate job of



keeping an outboard motor running. Most outboard manufacturers publish and issue free of charge an owner's manual with detailed and diagramed instructions on how to maintain, operate, and repair an engine. The major oil companies put out little handbooks containing similar information and give the word on proper lubricating procedures. Have these booklets handy for reference.

Common sense, a few simple tools, and a little patience are all you need from then on. Outboard motors are designed to give long and reliable service free of trouble. All you have to do is cooperate; provide the proper mixture of oil and gasoline; keep the spark plugs clean; keep the wiring in shape; and, in general, look after it.

There are many good outboard service stations, but there is always the chance that something might go wrong when you're in an isolated spot or it just isn't convenient to take your troubles to a mechanic. Hence, the necessity for carrying extra shear pins, cotter pins, spark plugs, a few tools and knowing how and when to use them. An extra propeller or wheel, as it is sometimes called, is a good idea, too. Look under "Outboard Motors" in the "Yellow Pages" of any local telephone book to find the name of the nearest outboard servicing dealers.

Basically, there are three things that can put your motor out of order: ignition, compression, and fuel.

Your engine manual will give the whole story, but we'll go into a few fundamentals of trouble-shooting right here. If the engine doesn't start or it quits after running, check the following in the fuel system first:

1. Is the vent in the filler cap closed or clogged?
2. Is the shutoff valve open?
3. Is there gasoline in the tank? (People have been known to forget to fill up with fuel.)
4. Are there any obstructions in the fuel line or gas tank screen?
5. Is the filter element on the engine clean? (This applies if you have a separate fuel tank piped to the motor.)
6. If your motor has a separate tank, check to see that the filler cap is tightly closed and sufficient pressure is pumped into the tank.

Next, have a look at the Ignition:

1. Have the spark plugs been fouled by surplus oil in the fuel mixture?
2. Are the plugs corroded or cracked or chipped?
3. Are there any loose or broken wires?
4. Do you have the correct gap between plug electrodes?

Now for the fuel itself:

1. Are the gas and oil in proper proportion?
2. Is there water in the fuel? (It can get there by condensation if a partially full gas tank is left overnight with the vent open.)

If it is none of these things, then maybe the trouble is compression:









1. Cylinder-head gasket blown out?
2. Piston rings clogged with carbon?
3. Pistons or cylinder walls worn?

If so, you've got a job for a factory-trained outboard mechanic. He can be identified by a factory diploma he hangs in his shop.

The Weather

A boatman has to know what to expect in the way of wind and water, so he develops the habit of looking at the sky, studying cloud formations, reading a barometer, and becoming familiar with local weather peculiarities. He knows what to do if bad weather overtakes him.

If you see the thunderheads piling up in the sky and ominous dark clouds bearing down your way, stay ashore. If these conditions arise when you are out on the water, put on life jackets, head for shelter in a hurry, go out again when the weather clears. If you get caught in a sudden squall, order your passengers to sit on the floor boards—keep the center of gravity low and reduce wind resistance—and then head into the wind and waves at low speed, keeping enough headway on the boat so that she holds her course. Should the engine stop for any reason, drop the anchor, pay out plenty of line, and lay low until the storm has blown over.

Daytime Signals				
Night Signals				
	SMALL CRAFT Winds up to 38 mph	GALE Winds up to 54 mph	WHOLE GALE Winds up to 72 mph	HURRICANE Winds 72 mph and up

 BLACK
  RED

There is no point in taking chances by trying to hammer one's way through a storm with its high winds, choppy water, and low visibility. Veteran aviators express their views on chance-takers in these words: "There are no old, bold pilots." By the same token there are very few old, bold boatmen; very few indeed.

How many times have you heard this couplet?

"Red sky at night, sailors' delight,

Red sky at morning, sailors take warning."

Well, weather forecasting is by no means that simple, but the verse does bring out a point that it is always well to bear in mind when you are trying to decide whether to go on a boating picnic, begin a weekend cruise, or stay home until the outlook is brighter. For all of its changeability—and the one dependable characteristic of the weather is its constant movement—weather almost always tips its hand before playing it.

There are many giveaways, fairly definite patterns in its behavior—and when you learn to recognize and weigh them properly, the elements rarely will surprise you. There are certain factors to be added up and balanced; there are reasonably clear-cut rules to follow in forecasting. We say "reasonably clear-cut" because, nature being what it is, there seem to be exceptions to most of the rules.

Many newspapers publish daily weather maps issued by the U.S. Weather Bureau. Look for them on the post office bulletin board, at a Coast Guard station, or at the local airport.

At first glance, of course, a weather map looks like an overwhelming confusion of figures, symbols, and shadings. A complete explanation of all the symbols and funny little marks is printed right on the back of the map.

Weather information in many areas is available from continuous UHF-FM broadcasting by ESSA (Environmental Science Services Agency).

When you are among those who know something about weather or talk as though they do as they peer learnedly at weather maps, you will hear the word "front" very often. There is nothing mysterious about weather fronts, how they come into being, and what effect they have on the weather ahead and behind them.

A front has been described accurately as a weather factory. Fronts develop when two different masses of air, each striving to retain its individuality, meet. Cold dry air from the polar

regions, flowing south over the United States, meets warm moist air moving northward from the tropics. The two kinds of air do not mix well so the cold air, being heavier, slides under the warm air and lifts it. A sloping boundary, rather sharply defined, is formed between the two air masses and this separation is called a front.

A cold front usually is accompanied by strong, shifting surface winds, squalls, and thunderstorms. Alto-cumulus clouds, a sign in themselves, may precede a cold front by as much as three hundred miles. Cold-front weather is often severe but of short duration.

A warm front normally brings less violent winds, but the sky will be heavy with great expanses of low clouds. There will be rain, maybe fog and poor visibility. The foul weather accompanying such a front lasts a long while as a rule, because the system covers a large area and moves slowly.

What the meteorologists call an extratropical cyclone is what happens when cold-and-warm fronts get together in a center of low barometric pressure, and there is a high pressure area behind the cold front. These storms produce weather that is a combination of the sort produced separately by cold-and-warm fronts. They occur often in the winter in the United States—twice a week on the average—but they are less frequent and not so violent in the summer. They take a day to reach full force, and they are likely to stay in one locality for three days.

The United States Weather Bureau publishes a booklet entitled *Weather Forecasting*. For those who wish to delve further into the mysteries of the atmosphere, the publication is recommended for its summarizing of the general conclusions that scientists have drawn from their long experience with the behavior of high- and low-pressure areas, storm tracks, and temperature changes.

Again a reminder, though, that the most valuable item in the amateur forecaster's kit is his knowledge of what is going on in his own neck of the woods. No matter how much he studies and absorbs from the works of meteorological experts, no matter how much he knows of what the weather is doing in other parts of the country, none of this store of information will do him much good, if he cannot supplement it with the results of careful and systematic analysis of his local weather observations.

He must ever bear in mind what one old weather-wise sailor used to tell young shipmates, "The weather we have with us now only tells what kind of weather we're going to have. The longer the time between the signs of change, the longer the altered weather will last; the less warning is given, the shorter the period of the new weather."

Local weather predictions are not reliable for more than twelve hours, because the clues rarely give more warning than that. Remember, weather is always on the move and that it moves normally at 25 miles an hour. Thus, what is one hundred miles to the westward of us now will be our weather within four hours or thereabouts.

Where do we get our weather clues, our tips on what is coming? Take a look at the sky. What kind of clouds are up there? Which way are they moving? What direction is the wind down on the ground or on the water? How gentle or how hard is it blowing? What does the thermometer say? What is the barometer reading? Is the air dry or damp?

By themselves, these clues have little meaning. Put together, weighed in combination with each other, they tell an interesting story; sometimes a bright and pleasant story, sometimes dull and foreboding. There are certain broad general rules for barometer and wind observations. Here are some of them:

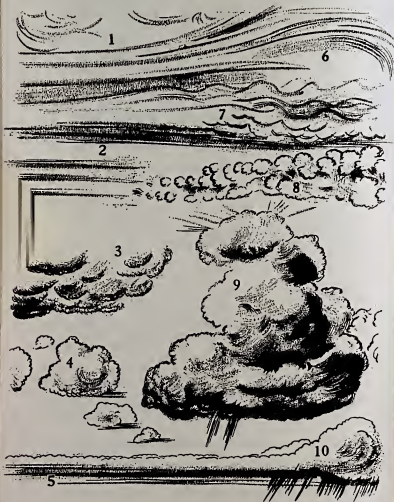
1. Wind in the easterly quadrant, barometer falling—foul weather on the way
2. Wind shifting to the westward, barometer rising—clearing, fair
3. Steady, slowly rising barometer—settled weather
4. Steady, slowly falling barometer—unsettled or wet
5. Rapidly rising barometer—clear and windy
6. Rapidly falling barometer—storm coming

Check these rules, though, against local experience. For instance, on the Pacific coast, local westerly winds picking up moisture off the ocean and strengthened by prevailing westerlies often bring rain while easterly winds coming off the mountain ranges are more likely to be dry. On the Atlantic coast, local westerly winds are usually fair, local easterly winds wet and cold.

The United States Weather Bureau has worked up a detailed wind barometer chart that is shown on the next page and is well worth your study. Keep a copy in the book in which you record your observations.

Wind direction	Barometer reduced to sea level	Indicated weather
SW to NW	30.10 to 30.20, steady	Fair for 1 or 2 days, slight temperature changes
SW to NW	30.10 to 30.20, rising rapidly	Fair, followed by rain in 2 days
SW to NW	30.20 and above, stationary	Continued fair, no decided temperature change
SW to NW	30.20 and above, falling slowly	Slowly rising temperature, fair for 2 days
S to SE	30.10 to 30.20, falling slowly	Rain within 24 hours
S to SE	30.10 to 30.20, falling rapidly	Increasing winds, rain within 12-24 hours
SE to NE	30.10 to 30.20, falling slowly	Rain within 12-18 hours
SE to NE	30.10 to 30.20, falling rapidly	Increasing wind and rain within 12 hours
E to NE	30.10 and above, falling slowly	In summer with light winds, rain may not fall for several days; in winter, rain in 24 hours
E to NE	30.10 and above, falling rapidly	In summer, rain probable in 12 hours; in winter, rain or snow with increasing winds will set in when wind in NE
SE to NE	30.00 or below, falling slowly	Rain will continue 1 or 2 days
SE to NE	30.00 or below, falling rapidly	Rain with high winds, clearing within 36 hours (followed by cold in winter)
S to SW	30.00 or below, rising slowly	Clearing in few hours, fair for several days
S to E	29.80 or below, falling rapidly	Severe storm imminent, followed in 24 hours by clearing (and in winter, colder)
E to N	29.80 or below, falling rapidly	Severe NE gale and heavy rain; in winter, heavy snow and cold wave
Going to W	29.80 or below, rising rapidly	Clearing and colder

WHAT CLOUDS MEAN



1. CIRRO-STRATUS If these clouds thicken, there'll be rain in 6 to 24 hours. If they slip a veil over the whole sky, a warm front or storm is near, 27,000 feet or more.
2. ALTO-STRATUS Indicates warm front or storm when thickening. Above 19,000 feet.
3. STRATO-CUMULUS When these clouds become dense, expect rain. If they form after showers, weather will clear. Above 8,000 feet.
4. CUMULUS If these clouds mass to windward (the direction from which the wind is blowing) they foretell a storm. If they grow in size on a summer day, there will be a thunderstorm. In small, widely separated patches they mean fair weather. 4,000 feet and over.
5. STRATUS Indicate light, steady rain. Above 18,000 feet.
6. CIRRUS If they do not increase, if they drift idly or stand still, or dissolve as the sun climbs; fair weather. Otherwise, rain or foul weather. Over 30,000 feet.
7. CIRRO-CUMULUS Indicate approach of weak disturbance, or, if increasing in density, rain in 24 hours.
8. ALTO-CUMULUS In small, isolated patches, or if dissipating, they mean fair weather. If piled up into domes, beware of thunderstorms. Over 12,000 feet.
9. CUMULO-NIMBUS Cumulo-nimbus is the thunderstorm cloud, and generally produces generous showers of rain, or snow, and sometimes hail to boot. Above 4,500 feet.
10. NIMBO-STRATUS This is a rain or snow cloud. Above 3,000 feet.

If you can read the signs in the sky like a good woodsman reads signs in the forest, it will help your weather forecasting immeasurably. Nature puts her clues right up there for all to see—the colors in the sky itself, the appearance of the sun, the shape and density of the clouds.

Bright blue sky usually means fair weather. A vivid red sky at sunset, fair tomorrow. The same sky at sunrise, maybe foul weather that day. Remember the jingle "... Red sky at morning, sailors take warning." If the sky is gray and dull at sunset, foul weather tomorrow. Cloudless sky when the sun goes down, fair and cooler tomorrow.

You've seen a ring around the moon. That halo (or corona) is the tip-off that a storm is on the way.

A weak, washed-out looking sun, probably rain. Cirro-stratus clouds blot out the sun, rain. At sunset, diffused and glaring white, storm coming. A bad night usually follows when the sun sets in dark clouds and the barometer drops. The ball-of-fire sunset (red at night), fair and warmer the next day. When the sun comes up out of a gray horizon, there's a good day ahead.

What are clouds? Merely fog in the air instead of down on the water or earth. They're formed when the air aloft is cooled below the point where dew forms. Good sailors read clouds like the stars, recognize them instantly, and know what they portend. They have many shapes and tell nearly as many stories. High clouds traveling across the sky in the opposite direction from lower clouds mean unsettled weather, for instance. Usually fleecy, light-textured clouds indicate fine weather and moderate breezes. Small, dark, oily-looking clouds are a sign of rain. An increase of streaks and patches of white clouds on the horizon after a stretch of nice weather means a change with wind or rain.

The Weather merit badge pamphlet contains charts and illustrations of clouds and more information on weather. These should be studied so that you can recognize the various clouds.

Good seamen prepare for the worst and, consequently, their surprises are usually pleasant. Not all storms are violent, but it is best to assume that they will be and take the necessary precautions. Fortunately, most storms are like rattlesnakes—they warn before they strike. Be sure that you know the warning "rattle" when you hear it.

Games

There is no substitute for experience in developing skill and savvy in boat handling, and a good way to obtain this experience is to play games that put a premium on proficiency in helmsmanship, control over the boat, and general alertness—games that bring into play many of the fundamentals the boatman must master before he is entitled to command.

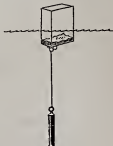
Games of this sort can put considerable zest into boating classes and help to while away the time in waterside camps, but it must be emphasized that the contests suggested here require a certain amount of room. Hence, care must be taken not to engage in these activities where they will interfere with the use of the waterway by other persons or where you yourself will be likely to suffer interruption or obstruction by passing craft.

Where reaching overboard is involved participants should wear life jackets.

Here are a few ideas for games. Experience with them probably will suggest other forms of competition with the same aims.



Flag buoy

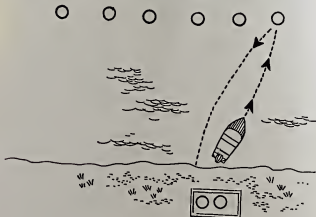


Can buoy

Buoys for these games are easily made. They can be fashioned best out of empty one-gallon oilcans with the cap tightly screwed on. White or yellow paint makes them easy to see. Their handles make a good fitting to which the mooring line can be secured. Old sash weights or coffee cans full of rocks or concrete serve very well as anchors.

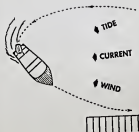
Potato Race

Eight brightly colored wooden blocks, painted oilcans, or rubber balls are put overboard at even intervals in a line extending 800 yards offshore. Crew gets boat under way; picks up furthest "potato" from beach; returns with it, dropping it into a box or basket on pierhead; then goes after others in rotation, leaving one nearest shore for last. Fastest time for completion of "potato" collection determines winner. When you consider the effect of boat's wash on position of floating "potatoes," you can see the possibilities in this game.



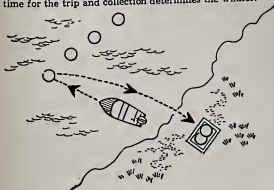
Pier-side Landing

Practicing landings as a game will make you more proficient at this technique. A good landing requires control of the boat and a knowledge of what effect the wind and current, if any, will have on the boat. In tidal waters or streams where there is noticeable current, it is best to make uptide or upstream landings unless the wind is so strong that it more than offsets these factors. Where current or tidal flow do not have to be considered, make your landing with bow into the wind, if possible.



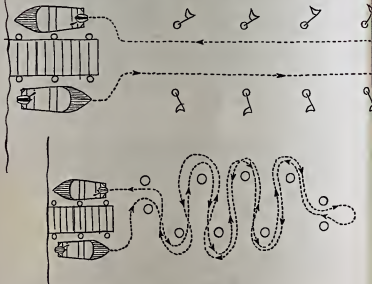
Balloon Race

Eight small balloons are inflated and set adrift in a line. Boat's crew has to collect these—the order is optional—and return to starting point with all of them in the boat. Fastest time for the trip and collection determines the winner.



Straight Run Course

Many beginners have a tendency to overcontrol when steering and, consequently, weave around and do what the old salts call "writing their names in their wakes." To teach steady straight steering try this. Set out (in a straight line perpendicular to the shore) six pairs of buoys spaced 10 feet apart and 100 feet between pairs. The contestant embarks properly from beach or pier, starts the engine, runs the course outward, makes a turn, and then runs the buoy gauntlet back to the starting point, and secures the boat properly.



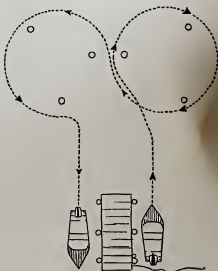
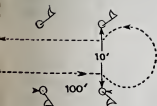
Slalom

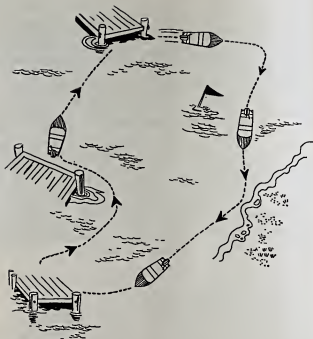
To develop skill in steering, making turns, and controlling speed. Set buoys out in pairs so as to form a flat "W." Start as before, run through the W turn and run it again in opposite direction before returning to starting point.

Figure Eight

To develop skill in turning at high speed. Set the buoys out to form two adjoining circles. Contestant leaves starting point, runs around the nearer circle clockwise, and then circles the other counterclockwise before returning for a good landing.

In all three of the contests shown here, penalties should be imposed for hitting buoys, passing them on the wrong side, and for mistakes made in getting under way and landing. Otherwise, time is the controlling factor in determining the winner. As a preliminary to the gauntlet, slalom, and figure eight, novices could be tested in the following simple drill: Embark properly; start engine; cast off lines; run a short distance offshore to an anchored boat, buoy, or stake; round it; return to starting point; make a good landing; secure the boat; and disembark. Form counts more than speed here.





Treasure Hunt

This is an exercise in piloting and the use of the compass. Ahead of time, a multilegged course is laid out on the lake or bay with each leg terminating at a landing where course directions for the next leg are hidden. Contestants are given the course to the first point upon departure. Upon reaching that point, they find directions to point two; at point two, they discover course to point three, and so on. Best time around the circuit determines the winner. To make things a little more difficult, compass courses may be shown on "clues" in the form of international code flags.

Service and Emergencies



The occasions on which the Scout boatman may render service to individuals and the community are many and varied. They could take the form of everyday courtesies and errands or operations for the saving of life and property in serious emergencies. Nowhere does the Scout motto "Be Prepared" mean more than it does in boating. The good Boy Scout boatman is always prepared and well-trained to teach newcomers; he is always prepared and competent to act when something has to be done well and quickly in a crisis.

There are many lakes and rivers in resort and hunting and fishing areas where a boat is the principal means of communication and transportation between camps and villages, between one settlement and another. You not only use a boat for pleasure—fishing, water skiing, and just cruising around—you use it to go after the mail, to fetch groceries from the village store, or to meet someone who has come as far as he can by railroad or car.

In these circumstances, it is important that you know thoroughly the body of water on which you operate. It is also important that you know where the nearest neighbor is located, who has the nearest telephone, where the nearest physician lives, and where you can find a game warden or policeman.

When rivers go out of their banks and floods threaten the low-lying countryside's camps, farms, and homes; the value



of a good boat that is manned by trained boatmen cannot be overestimated. When bridges are out and roads are under water, then the motorboat takes over. It evacuates people and livestock from flooded farms; delivers food, mail, medicine, and messages to persons marooned in the upper floors of their homes; and maintains communication between stricken communities when telephone wires are down and no radio is available.

In flood country, where such emergencies are likely to arise, the Scout troop with trained boatmen in its ranks should be organized and prepared to assist local authorities in critical situations.

When he is out on a lake or river or bay in his boat, the Scout should always be alerted to assist those who might be in need of help. The loan of a little gasoline, the towing of a boat with engine failure, the return of a boat that has gone adrift are small things, but the persons thus aided will be grateful to you and your Scout training.

Sometimes you can loan a pump or bailing can to someone with a badly leaking boat and help keep it afloat until it can be beached. There will be times when you may assist swimmers who overestimated their endurance and became tired before they could get back to shore. You may have to rescue persons whose boat has capsized or swamped.

If you find yourself in a situation that requires you to take

Correct sound, light, and manual signaling devices should be available at all times. Their proper use is required for normal operations and also for distress needs.





Staying with a swamped boat

people into your boat from the water, get them in over the stern. This is where you have the widest safety margin for such an operation. Getting someone in over the side is running the risk of capsizing your own boat, which won't help matters one little bit.

Should you have the misfortune to swamp or capsize, remember this—**STAY WITH YOUR BOAT**. Wooden boats usually have enough natural buoyancy to float upside down or on their sides, so hang onto them until help comes—that shore you are considering swimming to, may be further away than you realize. Metal and plastic hulls these days usually have special flotation chambers built into them or are fitted with material such as Styrofoam to give them buoyancy when filled with water. In such cases, they will stay close to the surface just as wooden boats.

There is another thing to remember in this stay-with-your-boat rule: It is much easier for people ashore or in other boats to see a boat with a head or two bobbing near it than it is for them to spot a lone swimmer.

The exceptions to this rule would be when the capsized boat is approaching the brink of a dangerous waterfall, spillway of a dam, or dangerous surf. Fire in the craft might also make "hanging on" unwise. If you capsize in extremely cold water (38° to 32°), get out quickly. It is paralyzing.

In a man-overboard situation—when someone falls out of your boat—first throw a life ring or floating cushion to him. Then turn immediately, circling up to him slowly and carefully so as not to risk injuring the person by hitting him with the boat. When alongside the person in the water, stop the engine and help him back aboard over the stern. If the engine is in the way and the man in the water can hang onto the boat for a minute or two, unrig the motor, lift it off the transom, and place it in the midships section of the boat before completing the rescue operation. Man-overboard drills should be held often. Try it first with a wooden box (or a life jacket) to practice maneuvering; later with a swimmer.

Glossary of Marine Terms

ABAFT—Toward the stern; behind.

ABEAM—Used in reference to the position of an object; at right angles to the fore-and-aft (center) line of the boat. For instance, another boat or a pier or a lighthouse is abeam when it is abreast of your boat.

ABOARD—On board. A person is aboard when he is on the boat.

AFT or AFTER—Near, toward, or in the stern (rear) end of the boat.

AMIDSHIPS—Halfway between bow and stern; in the middle.

ASTERN—Behind the boat; backwards. An object is astern when it is behind the boat. A boat is going astern when it is moving backwards.

BARNACLE—A form of marine life that grows on the bottoms of boats in salt water, having a hard, sharp shell. A good crop of them will reduce the speed of boats.

BEAM—Greatest width of boat. Boat is said to have 9-foot beam, for example, when it measures 9 feet at widest part.

BELAY—A command to stop; also a line is belayed when made fast.

BELOW—In the cabin or beneath the deck.

BEND—You don't tie lines together or around things; you bend two pieces of line together; you bend a line to an anchor.

BILGE—Curved or angular part of hull where bottom and sides meet; the space beneath cabin floor or floor boards.

BINNACLE—Protective casing for compass.

BITTER END—Extreme end of a line.

BOLLARDS—Short heavy posts on a pier to tie up boats.

BOOT TOP—Narrow stripe of paint at water line.

BOW—Forward (front) end of boat.

BULKHEAD—Partition or wall.

CALK—To make seams watertight by filling them with cotton, oakum, or similar material.

CEILING—A lining of thin planks on the inside of ribs (frames) of boat.

- CHART**—Marine version of a road map, showing buoys, water depths, shoals, etc.
- CLEATS**—Hardware to which lines fasten; made of wood, bronze, or iron with two hornlike projections parallel to deck or whatever center part is fastened to.
- COAMING**—Sides of cockpit above deck line to keep water out.
- COCKPIT**—Open divisions or compartments in a boat where passengers sit and helmsman operates.
- CUDDY**—Small partitioned space under foredeck for storage.
- DRY ROT**—Something you shouldn't have; decay in wood caused by fungus infection, usually stemming from poor ventilation.
- DRAFT**—Depth of hull from water line to lowest point of keel.
- FREEBOARD**—Vertical distance from water line to rail.
- FLOORS**—Short timbers bolted across keel to which frames are fastened.
- GALLEY**—Sailor's name for kitchen.
- GUNWALE**—Boat's rail, pronounced "gun'l."
- HATCH**—Opening through deck or cabin top to area below.
- HEAD**—Boat's toilet.
- HEAVE**—What you do with a line; you don't throw it, you heave it.
- HELMSMAN**—The person who steers.
- HULL**—The main body of the boat. Doesn't include cabins or deckhouses (they're part of the superstructure).
- KEEL**—Boat's backbone; extends from stem to sternpost.
- KNOT**—A measure of marine speed; a nautical mile (or 6,080.20 feet) per hour.
- LEEWARD**—Away from the wind.
- LIMBER HOLES**—Holes in floor timbers to allow bilge water to drain into lowest part of hull.
- PAINTER**—Line by which a small boat is towed or made fast.
- PORT**—Left. (Port side is left side looking toward front of boat.)
- RAIL**—Boat's side above deck line.
- STARBOARD**—Right. (Starboard side is right side looking toward front of boat.)
- STEM**—More or less vertical timber at bow; boat's entering edge.

STERN—Aft (back) end of boat.

SWAB—Sea-going name for mop. You swab down, not mop up.

TILLER—The stick or lever attached to rudder (or outboard motor) by which boat is steered. Sometimes called helm.

THWARTS—Cross seats in small boats.

THWARTSHIPS—At right angles to a center line passing through keel.

TOPSIDES—Sides of hull above water.

TRANSOM—The board or boards forming the after end of a more or less square-sterned boat. In outboard boats, it is that part of the boat from which the motor is hung.

TRIM—The way in which a boat floats in the water. If she leans to one side or the other, she is listing to port or starboard as the case may be. If she is heavily loaded forward she is trimmed by the head. If the after end is down and the bow up, she is trimmed by the stern. She is on an even keel when she is balanced all around, that is properly trimmed.

UNDER WAY—A boat is under way when it is moving through the water. She makes headway when moving forward, sternway when going backwards, and leeway when being set sideways by the wind.

WINDWARD—The direction from which the wind is blowing. The windward (weather) side of a boat is that toward the wind.

Acknowledgments

The Boy Scouts of America expresses its appreciation to the Evinrude Boating Foundation for permission to use material in this book taken from *Outboard Boating Skills*.

The *Recreational Boating Guide*, CG-340, U.S. Coast Guard, for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, was also a most useful source for text and illustrations.

BOATING RESOURCES

Recommended by the American Library Association's Advisory Committee on Scouting

BOOKS

Gibbs, Tony. *Sailing*. Franklin Watts, New York, 1974. \$3.95.

Introduction to sailing which includes both primary and advanced techniques. Many good, clear illustrations and photographs.

Gibbs, Tony. *Sports Illustrated Powerboating*. Lippincott, Philadelphia, 1973. \$3.95.

Good sections on handling powerboats of different types and sizes and the techniques of trailering.

Hammond, Geoffrey. *Show-down at Newport*. Walden, New York, 1974. \$12.95.

History of the America's Cup through the 1970 races. Boats, designers, skippers, sailmakers, and the changing tactics for this most prestigious of all yacht races.

Liebers, A. *Encyclopedia of Pleasure Boating*. Barnes, South Brunswick, N.J., 1973. Comprehensive guide to all

aspects of boating—choosing and maintenance of a boat, handling, piloting, and navigation.

Wallace, William. *Macmillan Book of Boating*. Macmillan, New York, 1964. \$14.95.

History of the great boats of the past, including the America's Cup yachts. Glorious color pictures. A great book to browse.

PAMPHLETS

Now Hear This! Know Your Ropes for Better Boating. Columbian Rope Co., New York, 1971. 50¢.

The varying uses of the different types of ropes, plus splicing and care of lines. Good, sound marlinspike techniques.

FILMS

Aids to Navigation for Boatmen (16mm, 27 min., sound, color).

Available from the U.S. Coast Guard as are many other films. This film locates and describes the different systems of aids to navigation, both state and Federal.

MERIT BADGE LIBRARY

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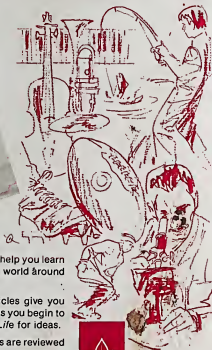
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